uncommon event to see a tree flourish for years and then slowly die off from "something at the roots": examination shows that the soil still contains the necessary foods, the water-supply is constant and good, the tree is exposed to no obvious adverse influences, and yet with steps so slow that they are scarcely noticeable, the tree begins to die off before its time. In some cases this is probably because the root-hairs are not receiving their proper supply of atmospheric oxygen, and this may be due to very slight changes in the *structure* (not the chemical composition) of the soil: a very slight diminution in the activity of the root-hairs may cause a diminution in the supply of water to the leaves at seasons when they require much, and this means lessening their supply of food-materials. If the leaves are placed on short commons, they cannot form wood, and so the next season's supply of nutritive solutions may be cut short; moreover, fewer root-hairs will be formed. No doubt differences will appear in different years or seasons; but if the tendency on the whole is in the above direction, the life of the tree is already limited—it may drag on for years as an object, which can scarcely be termed a tree however, but its doom is sealed.

The difficulty of placing one's hand on an exactly illustrative case is due to the fact that other causes are usually at work after a short time. I have purposely avoided any reference to the changes brought about in the chemical nature of a soil by the addition or cutting off of air, &c.; and for the same reason—to keep your attention directed to the root-hairs as living cells exposed to the influence of a definite environment—I have left out of account some questions of food-supply. These matters do not invalidate anything said above, but they do profoundly affect the problems of the diseases of plants, and especially those diseases which start from the roots.

ON THE PROPOSAL TO ESTABLISH A PERMANENT COLONIAL MUSEUM IN LONDON

THE proposal to continue the present Colonial and Indian Exhibition at South Kensington having met with a good deal of support, it is worth while to examine it on its merits; quite apart from the popular accessories of music, illuminations, &c., the continued existence of which depends upon altogether different considerations.

The first point for examination is whether such a permanent exhibition or museum would materially and usefully supplement or form a real addition to the existing public institutions of London, for upon the determination of this question the decision ought largely to depend.

On a general review of the vast collection of objects exhibited in the present Exhibition, they are seen to be mainly included under the four following categories:—

(1) Natural history objects, or specimens of the animal, vegetable, and mineral kingdoms of Nature.

(2) The raw products derived from them, and their economic applications.

(3) Art of every description, with which may be included objects bearing upon archæology and ethnology.

(4) Manufactures of all kinds.

(1) With reference to natural history, it can scarcely be a public desideratum to attempt to form a new museum of this kind when there exists, within a few hundred yards of the Exhibition, the finest collection in the world in the great national Museum of Natural History. There the animals, plants, fossils, and minerals not only of the British colonies, but of the whole known world, are exhibited with a fullness and in a manner that there could not be a possibility of in any way approaching.

(2) Then, as regards the economic uses of the vegetable kingdom at least—such as food-products, drugs, timbers, &c.—the nation possesses in the Museum of Kew Gardens a probably unrivalled public collection admirably exhibited. Many years of energy and a very large expenditure of time and money would fail to make up again such a collection as this has now become.

(3) Objects of art both ancient and modern form a very striking and important portion of the Exhibition. It is probable, however, that the best part of those which are not on loan have been sold or otherwise disposed of, and thus are not available for future exhibition. But with the South Kensington Museum at our doors, the initiation of a new art collection cannot be needed; whilst as for objects illustrative of ethnology and archæological specimens, they are, it is needless to say, magnificently displayed in the galleries of the old British Museum in Bloomsbury.

(4) There remains only the commercial products and manufactures of the colonies and India, and, so far as I am aware, there exists at present no general public collection of such articles. Here then, it appears to me, we have a reasonable basis for the formation of a permanent museum. A public collection of trade samples is a real want in London.

It appears, then, from the above observations, that no necessity exists for a new *general* museum of colonial and Indian productions, inasmuch as the public is already amply provided with other museums which illustrate fully nearly all the objects and articles proposed to be exhibited in the new one.

There is also good reason to think that the multiplication of museums is undesirable as well as unnecessary. We are not without experience of this, and the history of the late India Museum is quite to the point. The vast collections brought together by the Honourable East India Company were quite similar in kind to those it is now proposed to form, and illustrated very thoroughly the productions of India. But the Museum never attracted public interest or proved of much practical utility; many departments were neglected, the specimens badly conserved, and not available for consultation or study, and at last its condition having become somewhat of an official scandal, it was, six or seven years ago, broken up and dispersed. It bears strongly on the remarks above made that the collections had to be distributed among the very museums which I have there enumerated. No doubt additions of much value thus accrued to them; but there was also an immense mass of duplicate and damaged material, some of which at least was destroyed. After this experience it seems scarcely credible that a proposal to form again another general *Indian* Museum in London will be seriously entertained, whatever may be the case as regards the colonies. But in the latter, as in the former, it is almost certain that from similar causes a few years would witness the same history and a similar termination.

It is then, I believe, in a permanent museum of trade samples and of the commercial products of our colonies that a really useful outcome of the present Exhibition is to be sought. The precise scope and character of such a museum would of course require careful consideration; but there is a great and increasing want of some central emporium of a public character where authentic samples, accurately determined and labelled, can be readily inspected and examined by those interested in commercial pursuits. The collection might well be arranged geographically, and should be accompanied by maps, trade statistics, and other aids to inquiry. Under able management such a museum would be capable of rendering great service to the commerce of the Empire, and be the means of bringing into trade the numerous neglected products of the world. I may add, parenthetically, that it would also relieve the staffs of our chief scientific establishments of a good deal of work, involving often much sacrifice of time, which now falls upon them, though outside the scope of their duties.

The situation of such a museum should, however, be readily accessible to business men, and would be preferably in or close to the City rather than in the West End of London. HENRY TRIMEN

NOTES

THE International Geodetic Conference will assemble in Berlin on October 20. Its principal business will be to deliberate on the best method of executing the resolutions arrived at at Rome and Washington in 1883 and 1884 respecting the actual measurement of a degree on the earth's surface, and likewise in reference to a scientific survey of the European continent. The adoption by all nations of Greenwich as the first meridian, in accordance with the decision taken at Washington, is to be strictly enforced in practice. The introduction of international normal time, on the other hand, has had to be postponed, owing to insuperable practical difficulties connected with ordinary business life. In order to promote the project of any international survey of the entire globe, it is proposed to establish a Central Geodetic Office in Berlin.

THE Association for the Improvement of Geometrical Teaching has revised its "Syllabus of Elementary Geometrical Conics," and is about to publish the same, with three figures lettered in accordance with the enunciations of the Syllabus. The work will be interleaved to allow of teachers and students supplying their own proofs, and will, it is hoped, appear early in November. Messrs. Swan Sonnenschein are the publishers.

THE Bombay Government has just issued a long resolution on the subject of technical education, which is one of special importance to India. The resolution lays down the outlines of the scheme which it favours under three heads—agriculture, art, and mechanical industries. It proposes that the College of Science at Poonah should be a central institution for the teaching of higher agriculture, and that local classes and schools should be established throughout the province under the supervision of district officers and of the Educational Department. The Jamsetjee Jeejeebhoy School of Art in Bombay is to be the centre of Government efforts for the purpose of art teaching, and a report is called for as to the propriety of obtaining additional teaching. The question whether a technological institute for mechanical industries should be established is discussed at some length, and the Government expresses the opinion that the time for doing so has not yet come. Meanwhile, it is suggested that the Committee of the Ripon Memorial Fund should form itself into an a sociation for promoting technical education in Bombay city, the Government promising to give it the utmost possible aid. The main dependence of other parts of the province must be upon the high schools for elementary science, and upon such institutions as may be started by means of local efforts. The resolution concludes by saying that the scheme is not academic, but that it is meant to enhance the well-being of the people at large by giving increased employment to labour and capital, and by cementing harmonious relations between them.

THE International Congress of Orientalists was opened at Vienna on the 27th inst., under the presidency of the Archduke Rénier. This is the seventh Congress of this body, the previous ones having been held at Paris in 1873, at London in 1874, St. Petersburg in 1876, Florence in 1878, Berlin in 1881, and Leyden in 1883. The Austrian Minister of Public Instruction welcomed the members, of whom there were about 300, in the name of the Government.

DR. SCHWEINFURTH has, in the interests of science, addressed to all Europeans, especially physicians, residing in Egypt, an inquiry as to whether, so far as they are aware, families of Northern origin settling in Egypt do, or do not, die out within three generations, or whether the race is capable of being perpetuated beyond that limit.

WE are requested to announce that the seventh annual Cryptogamic and Botanical Meeting of the Essex Field Club will be held on Friday and Saturday, October 15 and 16, in Epping Forest, the head-quarters for the day being at Buckhurst Hill. A large number of well-known botanists have promised to take part in the meeting, and the naming and arrangement of the specimens collected will be in the hands of Dr. Cooke, Rev. Canon Du Port, Dr. Wharton, Mr. Worthington Smith, and other fungologists. Botanists and others desirous of attending should communicate with the Hon. Secretary, Buckhurst Hill, Essex.

THE U.S. Hydrographic Office has received the following note:—"August 31, at 9.45 p.m., the steamer *City of Palatka*, Capt. Vögel, when a mile and a half north of Martin's industry lightship (off the coast, south of Charleston), in eight fathoms and a half of water, experienced a terrible rumbling sensation, lasting a minute and a half. There was quite a heavy sea from the south-east after leaving Charleston Bar at 5.30 p.m. When this rumbling sensation took place the wave-motion ceased. It was a perfect calm during the rumbling; after that the usual motion of the south-east swell took place. The wind at the time was south-west, light, weather cloudy, barometer 30·1, thermometer 80°. The sensation resembled a ship scraping a pebbly bottom, and the vibration of the ship was very great."

H.R.H. THE PRINCE OF WALES has decided that the Colonial and Indian Exhibition shall close on the evening of Wednesday, November 10.

WE hear that the first of the Grocers' "Medical Research Scholarships" has been awarded to Dr. Sims Woodhead, of Edinburgh. The value of the award is 250*l*.

"PHILIPS' Planisphere, showing the Principal Stars visible for every Hour in the Year" (London: George Philip and Son), is perhaps the best means yet devised of getting a preliminary acquaintance with the aspect of the sky. It consists of a movable disk representing the celestial sphere, and a fixed horizon corresponding to the latitude of London. On the edge of the disk are inscribed the signs of the zodiac, the months and days of the year; on the horizon, the hours of the day and night. By merely rotating the disk until any given day and hour are brought to coincide, the stars above the visible horizon of London at that time come into view. A continuance of the movement from east to west exhibits ten apparent revolutions of the stars. Each successive group on the chart rises and sets in its proper order, while its distance from the sun at any selected date can be estimated by following a line drawn from the celestial pole to the corresponding section of the disk. Its point of intersection with the ecliptic indicates the position of the sun. The same lines show the differences between solar and sidereal time throughout the year. A very little attention will enable the student to distinguish the circumpolar stars, to track the course of the Milky Way among the constellations, and to acquire some rough notion of the magnitudes of the principal stars. Quite a little stock of uranographical information, in short, is concentrated in this ingenious toy.

A CAREFUL revision of the hydrographic map of the Lake of Geneva has been lately made by M. Hornlimann, soundings being taken by the steel-wire method. It is shown that between Lutry, Ouchy, Evian, and La Tour-ronde the bottom of the lake is absolutely horizontal. For distances of 2 kilometres and more the differences of depth did not exceed 0·10 to 0·15 m. (being thus quite within the limits of observational error. The point of greatest depth was met with in the line which joins the mouth of the Flon, below Lausanne, and the church of Evian, 7 km. from the Swiss side and 5 from that of Savoy. This was 310 m. (say 1034 feet). The bottom of the lake is here about 219 feet above the sea.